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ABSTRACT

This paper contains two reports on using competency based techniques in curriculum development. The first, on Clayton Junior College in Georgia, describes a 1975-77 study designed to identify competencies which faculty members reasonably expect from students having completed the general education portion of the core curriculum, to discover the strengths and weaknesses in the curriculum relative to the desired competencies, and to revise the curriculum accordingly. The first report also contains humanities, natural sciences and mathematics, and social sciences evaluation studies that include competency statements, descriptions of techniques for measuring competencies, and plans for future efforts. The second report discusses the implementation of competency based general education at Piedmont Technical College in South Carolina. The efforts of a Task Force to identify important "process skills" (cognitive skills, interpersonal skills and motivation) as perceived by college educators, administrators, community leaders, employers, and in the literature on the subject are reviewed. A broadscale community, student and faculty survey, which asked respondents to select expected competencies, and an industrial survey to discover communications skills required of graduates looking for jobs are reported. The communications and reasoning competencies generated from these activities were used to develop the educational delivery system which is also outlined. (TR)

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Using Competency Based Techniques In Curriculum Development

Clayton Junior College

Morrow, Georgia

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Piedmont Technical College

Greenwood, South Carolina

AMERICAN ASSOCIATION OF COMMUNITY AND JUNIOR COLLEGES

1978 Annual Convention, April 11

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USING COMPETENCY BASED TECHNIQUES

IN CURRICULUM DEVELOPMENT

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USING COMPETENCY BASED TECHNIQUES IN CURRICULUM DEVELOPMENT

Clayton Junior College
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The College and the Curriculum

Clayton Junior College, an institution of the University System of Georgia serving South Metropolitan Atlanta, opened its doors in the Fall Quarter of 1969 with 942 students. In the Fall of 1977, the college enrolled a total of 3,140 students in credit programs leading to an associate degree or a certificate. Approximately eighty percent of the students are enrolled in college transfer programs while the remaining twenty percent are enrolled in one of thirteen career programs offered.

Clayton Junior College is one of sixteen junior colleges in the thirty-two institution University System of Georgia. Clayton Junior College's college transfer program is designed to comply with the Core Curriculum of the University System of Georgia. The Core Curriculum provides the following four areas of study: Area I, Humanities, including, but not limited to, grammar and composition and literature, 20 quarter hours; Area II, Mathematics and the Natural Sciences, including but not limited to mathematics and a 10 hour sequence of laboratory courses in the biological or physical sciences, 20 quarter hours; Area III, Social Sciences, including but not limited to history and American government, 20 quarter hours; and Area IV, courses appropriate to the major field of the individual student, 30 quarter hours. The Core Curriculum gives assurance of full transferability of courses toward a baccalaureate degree, but preserves a maximum of institutional autonomy. Within the broad guidelines mentioned above, the faculty of Clayton Junior College is free to identify those courses which are appropriate to the various areas of the Core Curriculum. The college has followed a somewhat traditional pattern in the assignment of courses to the various areas and until October, 1975, had given limited attention to the purposes of the general education portion of the curriculum (Areas I, II, and III).

The Beginnings of the Study

During the Fall Quarter, 1975, the faculty was challenged to begin a study to identify those competencies which they consider to be characteristic of a liberally educated person upon completion of the general education portion of the Core Curriculum at Clayton Junior College. When these competencies are defined, the faculty will determine the strengths and weaknesses of the curriculum relative to the desired competencies. This evaluation will make possible a revision of the curriculum, enabling students to be more successful in acquiring these competencies. Competence is defined as the knowledge, skills, attitudes, and values needed to carry out an activity basic to success as a functioning individual in personal or professional life; it is the ability to meet or surpass a prevailing standard or standards of adequacy for a particular activity.

The desired outcomes of the study are to:

A. Identify those competencies characteristic of a liberally educated person which are reasonably expected by the faculty, once a student has completed the general education portion of the Core Curriculum at Clayton Junior College.

B. Identify the strengths and weaknesses in the curriculum relative to the desired competencies.

C. Revise the curriculum in order that students may acquire the desired competencies.

Although some progress was made during the Academic Year 1975-76, the identification of competencies and efforts at their assessment were very meager.

Effective with the Fall Quarter, 1976, task forces composed of faculty members representing appropriate disciplines were formed to carry out the study within Areas I, II and III. The members of each task force were appointed by the division chairman responsible for disciplines represented in the area of study. Each division chairman serves as an *ex officio* member of the corresponding task force.

To facilitate the study, a steering committee composed of the Dean of the College (Chairman), Registrar (Vice Chairman), Dean of Students, Director of Library Services, chairmen of the divisions, and chairmen of the task forces was formed to provide overall direction and coordination.

The Assessment Thus Far

The first major effort at an assessment of competencies was completed during the Winter Quarter, 1977. From this effort it became apparent that (1) some competencies should be added and others revised, (2) various methods of assessment must be attempted before acceptable inferences can be made to provide for appropriate curriculum planning and revision, and (3) curriculum revision is a certainty. Assessment efforts have continued during the succeeding quarters. Current and more specific results are included in each area task force report.

The Future

The emphasis at Clayton Junior College is on quality control of the general eduation portion of the curriculum rather than individual student assessment. A minimum of three years will be required to pursue adequately the assessment of the general education curriculum and to involve the faculty in appropriate curriculum revision. Considerable time, effort, and money will be devoted to the study in order to obtain the expected outcomes.

Following the anticipated three year intensive study, the college plans to maintain an ongoing program assessing the institution's strengths and weaknesses in providing a curriculum that enables students to acquire the desired competencies.

The Study and the System

The study which Clayton Junior College is undergoing is most appropriate and timely because the University System of Georgia has been and is involved in degree program assessment. At this time, assessment has been limited to exiting examinations in the major area of study at the baccalaureate degree level. The Core Curriculum, within the general guidelines described above, is the intertwining relationship that exists among the curriculums of the various institutions of the University System of Georgia. Because of the System's concern for degree program assessment, the general education portion of the curriculum is a natural next step for study by institutions.

HUMANITIES EVALUATION STUDY

The task force in Humanities consists of representatives from art, English composition, foreign languages, literature, music, philosophy, and speech. This report includes efforts of the Humanities task force to assess competency in Humanities of those students who have satisfied the Humanities requirements of the college.

Statement of Competencies

During 1975-1976, the first year of the study, the role of the humanities courses in the general curriculum and the way that each of the subjects fits into humanities was discussed. Given the diversity of the courses in the division, a statement of comptencies applicable to all the humanities courses is necessarily a statement more of global than of enabling abilities.

The person who has reached an acceptable level in Humanities can:

1. Read critically.
2. Reason analytically with an open mind.
3. See and hear with understanding.
4. Organize knowledge logically.
5. Discover relationships among discrete pieces of knowledge.
6. Trace historical developments in culture.
7. Express ideas precisely in words.

Efforts at Assessment

Having been charged with preparing an examination that would address these competencies, the task force realized quickly that an objective, factual type of examination would not be appropriate. A means of assessment was needed that would determine the extent to which the student could think analytically and make syntheses when confronted with some problem beyond the humanities courses completed. An interdisciplinary essay examination that required the student ot read in two different areas and to integrate the knowledge acquired by applying it to a specific topic was determined to be appropriate. Two different types of examinations have been piloted: a research paper examination and an essay exam.

Research Paper Examination

In January 1977, students were asked to choose from a list of topics, each covering two areas, and each including a short bibliography. The following is an example of the sort of topics offered: "Existentialist Philosophy and the Theater of the Absurd" (Sartre's *Existentialism Is a Humanism* and *No Exit,* Beckett's *Waiting for Godot,* and Esslin's *Theater of the Absurd*). At the time of the examination, about one month later, students were given specific questions based on their chosen topics. For the above subject, the question was: "List several philosophical themes of the Existentialists, and show how either *No Exit* or *Waiting for Godot* exposes these themes through the characters; if there is time, discuss the same themes as exposed by the plot and the production." Only students registered in a 200 level course that was at least their fourth course in humanities were asked to sit for the examination. Each paper was read by three professors, at least two of whom represented the disciplines covered in the question.

Of 29 papers that could be counted, 17 passed and 12 failed. Of the failures, at least five and perhaps as many as nine papers showed evidence of serious lack of preparation. A correlation with S.A.T. verbal scores and grade point averages also indicated that a majority of these students had scores below the acceptable levels for regular standing, i.e., below 350 verbal S.A.T. and 2.0 G.P.A.

All members of the task force agreed that the examination accomplished its goal, but that the following difficulties spoke against its repetition at the college: the reseach-type project did not fit into many of the course syllabi involved; the evaluation of the papers by the teachers was complicated and time-consuming; and, most importantly, the papers of a large number of students were not sufficiently prepared, and were therefore without value for the purposes of the test.

Essay Examination

In the fall quarter of 1977, a different sort of examination, one not involving previous preparation, was given. A paragraph showing logical errors, and treating a controversial subject, was given to the students. They were asked to answer four objective questions, dealing with the presentation of the argument and the consistency of the paragraph as a whole, and to write a short essay presenting their own views on the subject. Two hundred sixty-five students registered in their first course in humanities wrote the examination; of these, 62% failed and 38% passed. Sixty-two students who had finished at least four courses in humanities wrote the same examination; of these, 44% failed and 56% passed. It should be stressed that the latter figures do not give necessarily valid information, since the second group obviously consisted of different persons from those in the first, and since the two groups varied greatly in size. However, the figures are probably accurate in demonstrating that many students do improve from an unsatisfactory to a satisfactory level during the course of their studies in humanities.

Plans for Future Efforts

Current projects are centered less on formulating area examinations and more on describing the curriculum in terms of the principles of competency based education. The task will involve, of course, close cooperation among the different liberal arts divisions, as they attempt to agree on the "global competencies" and the "enabling competencies" proper to the transfer program and its diverse parts. The Division of Humanities already includes several courses where the evaluation of students is explained in terms of competencies; it is possible that other professors will adopt similar ways of explaining standards for evaluation to students. It is also possible that the faculty will revise the offerings in humanities; no definite proposals have been made at this time. Our experience in the classroom and the results of the study indicate at this time that students are in need of a broader background in humanities than is possible under the present curriculum.

NATURAL SCIENCES AND MATHEMATICS EVALUATION STUDY

The task force in Natural Sciences and Mathematics includes faculty members from biology, chemistry, mathematics and physics. The report below includes progress of the Natural Sciences and Mathematics task force in the evaluation of the curriculum in Natural Sciences and Mathematics with respect to General Education. The purpose of the evaluation study is to determine if students are competent in Natural Sciences and Mathematics after satisfying the college's requirements in those areas.

Statement of Competencies

Competency statements for science and mathematics were developed by the Natural Sciences and Mathematics task force. A person who has reached an acceptable level in Natural Sciences can:

1. Identify problems suitable for investigation.
2. Choose suitable hypotheses when given a problem.
3. Select valid procedures for data collection.
4. Identify accurate interpretations of data.
5. Distinguish between valid and invalid implications of results.
6. Identify principles and facts within the subject area of choice.

The science competencies require the student to demonstrate both process skills (i.e., accurate observation, description, testing, and reporting) and understanding of the fundamental body of knowledge in science using either biology, chemistry, or physics as the mode of entry.

A person who has reached an acceptable level in mathematics can:

1. Perform basic arithmetic computations.
2. Read graphs and tables.
3. Answer questions related to statistics and probability.
4. Solve specified types of equations.
5. Distinguish between deductive and inductive reasoning.

The mathematics competencies require the student to demonstrate basic mathematical skills (i.e., arithmetic and algebra) as well as use of mathematical logic.

Efforts at Assessment

Efforts to assess competency in Natural Sciences and Mathematics include the development and piloting of a test instrument. The exam consists of multiple-choice items based on the competencies which were developed by the task force. There are two parts to the exam: science and mathematics. An objective format was selected for purposes of norming, standardization, and reliability in scoring. Machine analysis and scoring of large numbers of tests is possible with the objective format, as is generalizability from one quarter to the next. Although all test items are competency referenced, the test is analyzed using norm-referenced techniques. By validating both the competency level and the discrimination index, items chosen for the test should discriminate between high and low achievers and measure competence as determined by a panel of judges. If items are shown to be both discriminating and competency based, the test should accurately measure the extent to which students have achieved the competencies.

Mathematics Examination

The mathematics exam was devloped from a pool of items submitted by the mathematics faculty. The items were validated as to competency and acceptability by a team of in-house mathematicians. The current form of the test consists of 50 items which are grouped in five subtests, one for each competency. The original version of the test has been piloted by approximately 200 students.

Science Examination

The science exam was developed in the same manner as the mathematics exam. Items, however, are referenced only to the process skill competencies. The exam, called the Science Competency Assessment Test (SCAT), has been revised once. The revision was based on results of piloting the

preliminary version with more than 300 students, most of whom had completed a two-quarter laboratory science sequence. The SCAT measures competence in the science process skills regardless of the discipline of science studied. The test consists of 50 items which are grouped in five subtests, one for each process competency.

Plans for Future Efforts

The science faculty is writing the competencies which students should demonstrate if they have developed insight into the seven Conceptual Schemes of Sciences as defined by the NSTA Conference of Scientists. The competencies vary for each discipline, although the conceptual schemes stay the same. Results of this effort will replace Science Competency Six. The competency statements, when completed, will be compared to the current curriculum in each discipline to determine the extent to which students are directed toward the competencies. Adjustments in course content will be made if necessary and appropriate tests will be developed and validated. These tests, along with the SCAT, will assess two of the three dimensions of the science curriculum. The third dimension is not discussed here because of space limitations.

The mathematics faculty is considering narrowing the scope of the competency statements so as to make them more skill oriented. This action will necessitate both a change in the test and a change in the mathematics curriculum.

SOCIAL SCIENCES EVALUATION STUDY

In an effort to assess the strengths and weaknesses of the social science curriculum, representatives from economics, history, political science, psychology, and sociology organized in 1976 a task force to identify competencies characteristic of a liberally educated person and the means by which the social sciences could facilitate development. For a rationale, the task force assumed that based on historical perspective and an awareness of other cultures, times, and lifestyles,an increased understanding of self and society is the contribution of the social sciences toward a liberal education, and that because of the premium which our rapidly changing job market places upon flexibility and adaptability rather than specialization, the curriculum should stress a broad general education.

Statement of Competencies

Consequently, the initial objective was to describe, in general terms, the competencies which should be attained through social sciences courses. After extensive discussion and study, it was determined that an individual who has reached an acceptable level in social sciences can:

I. COMMUNICATION COMPETENCE

A. Effectively utilize the English language, demonstrating proficiency in vocabulary, spelling, mechanics, sentence structure, reading skills, and paragraph composition. Furthermore, the graduate will have demonstrated some familiarity with research techniques and will have written documented essays, using both primary and secondary sources.

B. Analyze and evaluate information and ideas, comprehending the components and procedures of critical and creative thinking and utilizing an evaluative procedure in decision making.

II. VALUES COMPETENCE

A. Comprehend the nature of cultural values and standards of conduct, their differences, functions, and relationships.

B. Comprehend the historical developments of dominant values as identified in basic social institutions, as they existed historically, and as related to human behavior and creation of institutions.

C. Analyze the ways cultural values are influenced by heritage and how they may differ within a culture. Specifically, the graduate can compare specific standards of conduct which shape socialization experiences, identify and understand personal standards which influence outlook, and analyze socialization processes which result in dissimilar personal values.

D. Assess relationships between major value systems and make relevant judgments about their costs, validity, implications, etc.

III. SOCIAL SCIENCE COMPETENCE

A. Understand the function of the divers social science disciplines and their unique methods of inquiry.

B. Relate or integrate substantive knowledge with that from other fields of study in the analysis of selected problems and assess alternative solutions.

C. Assess, to some degree, the validity of attempts to answer broad questions about Western traditions as posed by historians and social scientists.

1. One can explain the historical significance of major political and economic theories of Western Civilization.

2. One can demonstrate some understanding of the sources, development, and current impact of major movements such as nationalism, imperialism, democracy, the concept of balance of power, communism, trade unionism.

3. One can identify salient characteristics of theories of human behavior and interaction and can evaluate their usefulness and impact upon modern civilization.

IV. SELF-ASSESSMENT COMPETENCE

A. Comprehend the nature and significance of personal development and assess self-development. One can recognize and differentiate basic emotional impulses, assess their consequences, and evaluate emotion control. One comprehends the characteristics of autonomous action and recognizes internal and external restraints on personal autonomy. One can analyze the basic dimensions of personal experience and assess their potential creative and/or destructive consequences to self. One can analyze interpersonal relationships, personal goals and life-style considerations, personal values, and the consequences of actions influenced by those values.

B. Understand the place of physical activity in physiological, intellectual, social, and emotional development in a leisure-oriented society and demonstrate the knowledge and skills needed for continued participation in meaningful physical activity beyond the college experience.

Efforts at Assessment

During the Fall and Winter of 1976-77, an evaluation instrument was prepared to determine the extent to which the Social Sciences curriculum was successful. Students first read a brief essay entitled "Our Historical Experience," by former Secretary of State Henry Kissinger. They then responded to a series of mutiple choice questions which tested their ability to recognize and recall information. From a choice of seven possible essay topics which were related to the article, the students next wrote an essay demonstrating their organizational composition skills and ability to analyze, to discriminate among values, and to make judgments about the validity, consequences, and other implications of alternative views.

Administered during the Winter Quarter, 1977, this preliminary effort at curriculum assessment revealed that students consistently were unable to organize their ideas into logical and coherent statements. There was widespread inability to analyze, synthesize, and make generalizations; grammatical errors were common. In short, the examination demonstrated that social science course offerings were not adequately preparing competent graduates. Consequently, there was general consensus that a fundamental revision of the program was necessary before levels of proficiency would be improved.

Curriculum Revision

Beginning in the Spring, 1977, the faculty begancurriculum revision. Completed in November, 1977, the revised Social Sciences curriculum is divided into four sections:

Section One - American History

One course of American History will be taken in which historical competencies will be emphasized.

Section Two - American Government

Development of competencies related to government and politics will be accomplished through a course in American Government.

Section Three - Behavioral Sciences

To introduce the student to behavioral science disciplines and to develop competencies common to them, one course from offerings in economics, psychology, and sociology will be selected.

Sections one, two, and three must be completed before a student proceeds to the fourth section of the curriculum.

Section Four - Western Civilization

This course will include an interdisciplinary examination of Western Civilization. The course will trace the roots of modern man, his cultures, and political and economic systems. It will stress the interdisciplinary nature of the liberal arts, and the importance of each in life. The interdisciplinary focus of the course will allow a re-emphasis on reinforcement of the competencies taught in the first three sections of the curriculum. It will also serve as a logical point for the overall assessment of the social science curriculum.

Plans for Future Efforts

Now that the general structure of the curriculum has been designed, faculty members are currently developing evaluative criteria and standards for each of the competencies. General competencies not readily assigned to a particular discipline are shared by each course, but each is approached differently. Cultural values, for example, are defined differently by each discipline, as are broad questions about western traditions, but the emphasis is to make broad competencies meaningful within the boundaries of the divers courses. Implementation of the competency based curriculum is projected for Summer, 1978.

HUMANITIES EXAMINATIONS

	N	PASS	FAIL
Research Paper Examination	29	17	12
Essay Examination$_1$	265	101	164
Essay Examination$_2$	62	35	27

HUMANITIES COMPETENCIES

1. Can read critically.
2. Can reason critically with an open mind.
3. Can see and hear with understanding.
4. Can organize knowledge logically.
5. Can discover relationships among discrete pieces of knowledge.

MATHEMATICS EXAMINATION

FORM A

	MEAN	NO. OF ITEMS
Arithemetic Computations	7.37	13
Graphs and Tables	3.60	8
Statistics and Probability	3.22	8
Equations	4.22	13
Deductive and Inductive Reasoning	4.01	8
TOTAL TEST n = 85	22.62	50

FORM B

	MEAN	NO. OF ITEMS
Arithmetic Computations	6.24	13
Graphs and Tables	4.75	8
Statistics and Probability	3.55	8
Equations	5.16	13
Deductive and Inductive Reasoning	3.57	8
TOTAL TEST n = 104	23.27	50

SCIENCE COMPETENCIES

1. Can identify problems suitable for investigation.
2. Can choose suitable hypotheses when given a problem.
3. Can select valid procedures for data collection.
4. Can identify accurate interpretations of data.
5. Can distinguish between valid and invalid implications of results.
6. Can identify principles and facts within the subject area of choice.

MATHEMATICS COMPETENCIES

1. Can perform basic arithmetic computations.
2. Can read graphs and tables.
3. Can answer questions related to statistcs and probability.
4. Can solve specified types of equations.
5. Can distinguish between deductive and inductive reasoning.

SCAT DATA
WINTER, 1978

1. Can identify problems suitable for investigation.

   $\bar{X} = 5.19$

2. Can choose suitable hypotheses when given a problem.

   $\bar{X} = 7.03$

3. Can select valid procedures for data collection.

   $\bar{X} = 7.24$

4. Can identify accurate interpretations of data.

   $\bar{X} = 6.63$

5. Can distinguish between valid and invalid interpretations of data.

   $\bar{X} = 6.34$

TOTAL TEST MEAN = 32.43
n = 170
r = .76

SOCIAL SCIENCE
Curriculum Revision

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IMPLEMENTING COMPETENCY BASED GENERAL EDUCATION AT PIEDMONT

To understand the shape of competency at Piedmont, it is crucial to understand the institutional context in which our competency program in General Education developed. First, General Education at Piedmont has a service function. Liberal arts at Piedmont are not the driving force behind the curriculum. Our purpose is to serve the technical curriculum and provide their students with a core of skills that are important for people in adult roles. Secondly, we had the concern of quality control. Sixty-five percent of our instruction is done by part-time people with varying skill and commitment. Student grades, as a consequence, were often higher than warranted, as indicated by subsequent performance. Thirdly, advisory committees of the school indicated the greatest weakness of our graduates were in the basic skills of communicating, solving problems and relating effectively to other employees on the job. Consequently, even as a technical college, we felt that "marketable skills" should not be defined too narrowly. Without broad skills that would enable them to adjust to the changing job market, many students would be left without jobs when technological advances overtook them. So at the outset of our journey toward competency we had identified the broad specifications for the system. It had to be: (1) addressed to the educational needs of students who, in a variety of adult roles, must respond to rapid changes in an increasingly complex technological society, (2) consistent with the General Education Division's service role and, of course, (3) manageable.

Before going further, it is crucial to state what Piedmont means by competency based education. A variety of very different approaches fly under the term "competency based education," since the term is politically useful with many publics. In this debate, I side with Humpty Dumpty, who blithely affirmed in *Through the Looking Glass:* "When I use a word, it means exactly what I choose it to mean -- neither more nor less." So here is the meaning we attach to the phrase, stated in terms of the crucial elements a competency based educational system possesses. First, the focus will be on doing more than knowing. The concern is how students *use* knowledge, not how much they can memorize. Second, there must be a systematic determination of what is important to learn or what the results of the educational process should be for students. Third, there must be a systematic way for determining that students have indeed learned what has been identified as important to learn.

This presentation will focus on the question of what is important to learn. There are numerous potential sources of input for answering this question. Here are the sources of input we tapped and how we did it. Teachers, traditionally regarded as experts in their subject matter, have normally controlled what has gone into the curriculum. Typically, English instructors in freshman composition determines what to teach within the borad framework of a course syllabus. Piedmont, however, expanded the scope of this source of input. First, our Vice President for Educational Affairs established a Task Force, composed of faculty members of the three academic divisions responsible for the instruction of degree students. This Task Force was charged with the responsibility of determining what general competencies all degree students should possess. Among other activities, this Task Force insured that all faculty members, through a survey, had the opportunity to express what was important for their students to learn in general education. So instructors played the pivotal role in identifying competencies.

There are other sources of input as well. One place to look is the community at large. If we claim to be a community college, then, in fact, the community might logically assert a claim to have some input into the curriculum. In fact, the claim to be a *community* college without taking this input seriously could well be considered spurious by some. To gather community perceptions, Piedmont, led by the Task Force, took a random sample of 342 people in its service region. Students, the Task Force believed, should also have a role in shaping the curriculum. Consequently, a random sample of students, including 177 graduates, non-graduates, continuing education and 220 current students cooperated in a survey designed by the Task Force. Next, the Task Force recognized the impact employers could have on technical curricula through the advisory boards, but saw an additional role for other community leaders. Based on the literature and personal knowledge, the Task Force knew that community leaders and employers were quite concerned about skills other than technical. So we surveyed 204 of them.

In an attempt to build the largest possible knowledge base, the Task Force spent considerable energy in reviewing the literature related to competency based education, including descriptive, empirical and theoretical works. Also, members of the Task Force visited institutions which had implemented various approaches to competency based general education.

Our process of gathering information as described produced results that were quite useful in developing our program. Here is a description of these results. First, there was an assumption made by the faculty and administration at Piedmont about what is important to learn. The assumption was the primacy of process over content. The traditional content theory of education emphasizes that there is a body of knowledge which is crucial to be passed on from one generation to the other in order to maintain a cultural tradition. Increasingly, this subject matter is tied to a specific discipline. As knowledge has increased in a discipline, so has specialization, in order to make the management of such knowledge possible. As a result of such specialization within all disciplines, undergraduate education has been fractured and has often tended to focus on the learning of facts without framework. Thus, English composition was done in one place, history, physics and engineering in others. In a cacaphonous chorus, instructors would decry the poor ability of their students to communicate effectively or reason soundly. Unfortunately, however, if students were to master content they regarded as important, professors had no time to relate their discipline to these skills. That was the problem of the English Department.

Consequently, numerous writers in higher education decry the trend of specialization and proclaim the need for more communication among disciplines. One response to this dilemma has been the creation of interdisciplinary courses where the content is still the focus. But at least the content from different disciplines illuminates a common theme. Based on a review of the literature and our hunches, competency at Piedmont assumed another alternative -- that certain *process* skills important to many academic disciplines exist and are related to what is important for people to do in the world outside academia as well. This perspective is crucial for three reasons. First, having technical students attempt to master a body of liberal arts content made very little sense. Too much information was available in traditionally academic disciplines. Moreover, there appeared to be no end to the rapid production of knowledge. Having the skills to process such knowledge appeared to be more important to us. Next, the focus on process rather than content allows the instructor to utilize a variety of content while focusing on common skills. Content can be selected on the basis of its utility in a particular career or some other student interest. Personalized instruction, then, becomes a reality. Any content could be used. The students can have more control of their education by learning content relevant to them while learning skills that society values and that are important to them in a variety of contexts. For example, if the process is *describing*, a student in human services could characterize delinquent behavior. Electronics' students could describe the appearance of an oscilloscope. Students in a literature course could depict Keat's twitter of the bird on the Grecian urn. Third, there is considerable evidence available to document the existence of generic skills common to success in many human endeavors. For example, research done by McBer, a Cambridge-based research firm, indicates that there are three generic skills crucial for people performing a variety of occupations including human service workers, counselors, small business entrepreneurs, policemen, salesmen, mid-management people and military officers. The first is a *cognitive* skill, that is, the ability to process complex and conflicting data and to create order and derive meaning from a jumble of information. Secondly, is an *interpersonal* skill which is primarily the ability to empathize with other people. Here the important thing is to diagnose the stated human concern and send an appropriate response to the person. The third generic skill is *motivation* here defined as the ability to take risks, to set realistic goals and to seek information for use as feedback in improving performance. So one major determinant of our competency structure was our assumption of the primacy of process over content.

As indicated earlier, input from the community was important in determining what students should learn. The survey sought input from three sources: a random sample of people in our seven county areas, a random sample of our students, past and present, and the entire faculty, staff and administration. There was striking congruence on the results people expected from Piedmont, given that they could choose from 31 items. Here is a brief summary of the findings. The number in the columns represents the rank each group assigned the item.

	COMMUNITY	COMMUNITY LEADERS	FACULTY STAFF AND STUDENTS	COMPETENCY WHICH ADDRESSES ITEMS
Get a job and keep it	1	3	1	CR
Make decisions	2	2	4	R
Get along with family members	3	0	6	R
Know about handling money	4	–	10	R
Get along with fellow employees and supervisors	5	1	3	CR
Feel good about themselves	6	5	1	R
Know how to think things through	7	4	5	CR
Take directions	8	8	7	C
Know how to read well	9	6	8	C
Use good English in talking	10	–	–	C
Know how to solve problems	–	7	9	CR
Know how to learn new things	–	9	–	R
Know how to be a good citizen	–	10	–	

In addition to the broadscale community survey, Jean Mahaffey, the Head of our English Department, did an industrial survey to identify the communications skills required of students taking jobs after graduating from one of Piedmont's 13 degree programs. (If you wish a detailed description of this process and its results, please write Jean at Piedmont.)

As a result of these assumptions and input, we established the following competencies for our General Education Program:

> *Communications Competency* -- A competent person can coordinate his/her own communicative skills with the requirements of the immediate situation and audience to respond in an appropriate form of discourse which incorporates satisfactory mechanical, linguistic, and rhetorical principles.
>
> *Reasoning Competency* -- A competent person can identify requirements for applying, and then effectively apply, basic reasoning steps in order to successfully make decisions, solve problems, and analyze situations arising in vocational, social, personal, and community contexts.

A brief discription of these competencies, unfortunately, is all that space permits at this time. The communications competency focuses on the full range of skills related to jobs, technical courses, and to personal success. The students sequentially master speaking, reading, listening, and writing skills as a total interrelated process at all levels rather than as separate activities. First students master the process skills involved in giving and receiving directions, explanations, objective reports and descriptions. The next level has students focus on gathering, validating, classifying, using and presenting information about a narrowly defined topic. (Interviews of people with established expertise on a topic, which might range from moonshine to the environmental impact of a proposed dam, constitute the major source of information.) The final level has students utilize the skills developed previously and has students apply them to a tightly focused job-related project. For example, a student might plan an actual travel itinerary, including dates, costs, timetables, locations, etc., for X people going ABCDE places with FGHIJK requirements and constraints. Each student would obtain data from primary and secondary sources, by generating the communication products, e.g., letter, required in order to determine what to do and how to do it.

The reasoning competency reinforces relatively simple, generalizable skills. Students learn such core skills as defining the problem, classifying, gathering information, being specific, valuing, using evidence, and using cause and effect. Students also learn that there is more than one good way to solve problems; several solutions are often equally correct; and consciously knowing that they reason and how they reason helps them exert more control over their lives. As a result of pilot testing this year, we will implement a required three hour course this Fall, utilizing career development content as the vehicle for learning these skills. Additionally, current efforts to utilize curriculum content, e.g., troubleshooting electronic circuits, will continue in order to reinforce the reasoning skills and demonstrate their practicality in a variety of contexts.

Though we obviously use content to teach these process skills, the delivery system itself is content free. This point is crucial for two reasons. First, these skills are applicable to all disciplines. The reasoning skills, for example, can be taught using content from career development, electronics, sociology, etc. Next, since the process skills are applicable to all disciplines, they have the potential for being reinforced by all disciplines. Our system can incorporate content from various sources. For example, one of the process skills in our reasoning competency is gathering information that could be acquired and demonstrated with content from diverse disciplines and courses such as electronics, economics and literature.

This approach has the following benefits:

1. It accomodates a diversity of student interests while developing skills useful to individuals and society.
2. It provides a mechanism for major subject areas to reinforce general education competencies.
3. It can be operated independently of instructors in major subject areas.
4. It allows us to teach "more" general education with no more credit hours.

To no one's surprise, this approach has a set of difficulties that accompany it.

1. Management of the materials for the learning activities can be cumbersome.
2. The system requires considerable energy to operative effectively.
3. Finding and retaining part-time instructors to use the system will probably be difficult.
4. Full effectiveness of the system relies on all faculty members.

Though our system has only been piloted with three curricula, we believe the elements for a greatly improved instructional program are in place. Modifications, of course, will occur over time as needs arise and as we determine more precisely recisely what works best at Piedmont.

CONTRIBUTORS TO PIEDMONT TECHNICAL COLLEGE'S COMPETENCY BASED GENERAL EDUCATION PROGRAM

NAME	FIPSE TASKFORCE	COMPETENCY INSTRUCTORS	CURRICULUM PARTICIPANTS	ADMINISTRATIVE ADVISORS
Kit Adkins, Reading Instructor	X	X		
Rhella Allred, Counselor/Curriculum Developer	X	X		
Charlie Baumeister, Business & Technical Division Dean				X
Capers Brazzell, Human Services Department Head			X	
Chuck Drake, Business Department Head			X	
David Elledge, Counselor		X		
Ken Ferguson, Electronics Engineering Instructor			X	
Jim Hudgins, Vice President for Academic Affairs				X
Jean Mahaffey, English Department Head	X	X		
Margaret Martin, Human Services Instructor	X	X	X	
John McCravy, Engineering Graphics Department Head			X	
Curtis Miles, Project Director	X	X		X
Norman Murphy, General Education Dean		X		X
Ernest Prewett, Student Services Dean				X
Jim Rehg, Electronic Engineering Department Head	X	X	X	
Marci Rehg, English Instructor		X		
Richard Upchurch, Mathematics Department Head	X	X		

For more information, write Curtis Miles, Project Director, Piedmont Technical College, P.O. Drawer 1467, Greenwood, South Carolina. 29646

Instructional Context

1. Service role of General Education
2. Quality Control
3. Occupational/life Requirements

Potential Sources of Input

Instructors

Task Force

Community

Students

Employers

Literature Review

Competency Programs

Definition of Competency Based Education

1. A focus on doing more than knowing.
2. A systematic determination of what is important to learn.
3. A system for determining that students have learned it.

Factors Determining the Shape of Piedmont's General Education Curriculum

1. Assumption of the primacy of process over content
2. Input through community survey
   a. community members
   b. students
   c. faculty, staff and administration
   d. community leaders

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Survey Results

	Community	Community Leaders	Staff and Students	Competence Which Addresses Items
Get a job and keep it	1	3	1	CR
Make decisions	2	2	4	R
Get along with family members	3	0	6	R
Know about handling money	4	-	10	R
Get along with fellow employees and supervisors	5	1	3	CR
Feel good about themselves	6	5	1	R
Know how to think things through	7	4	5	CR
Take directions	8	8	7	C
Know how to read well	9	6	8	C
Use good English in talking	10	-	-	C
Know how to solve problems	-	7	9	CR
Know how to learn new things	-	9	-	R
Know how to be a good citizen	-	10	-	

Competency Statements

Communications Competency - A competent person can coordinate his/her own communicative skills with the requirements of the immediate situation and audience to respond in an appropriate form of discourse which incorporates satisfactory mechanical, linguistic, and rhetorical principles.

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